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Acurex Corp., Mountain View, CA

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by

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EPA Contract No. 68-02-3652

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ABSTRACT

This report is the first data summary of gaseous emissions sampling and analysis results compiled in the Gaseous Effluents Data System (GEDS). The GEDS is a component of a group of interrelated computerized data bases named the Environmental Assessment Data Systems (EADS) which describe multimedia discharges from energy systems and industrial processes. The EADS was designed to aid researchers in environmental assessment, source characterization, and control technology development. This report summarizes the data compilation from the implementation of the GEDS in 1980 through 1982. It lists the sources reported in the GEDS, feed materials used, chemical analysis data on hazardous and priority pollutants, and the number of samples for each sources.

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SECTION 1

INTRODUCTION

The Gaseous Emissions Data System (GEDS) is a computerized information system that contains the results of sampling and analysis activities performed on gaseous media discharges from energy systems and industrial processes. The GEDS is one of four waste stream data bases which make up the Environmental Assessment Data Systems (EADS).[1] The GEDS became operational in June 1980. This annual report describes the GEDS and its growth, contents, and future within the EADS.

The EADS is a comprehensive system of computerized data bases that describe energy systems, industrial processes, control technologies, and process discharges. Moreover, the EADS is a protocol for data analysis and evaluation that allows users to make consistent and meaningful interpretations of the data collected and reported. The EADS protocol may be applied to any type of sampling and analysis activity in which discrete samples are collected.

The EADS is composed of four operational data bases for multimedia product, process, or waste streams sampled and analyzed, that are supported by a variety of reference data bases and data evaluation programs. This is shown in Figure 1. The four sampling and analysis data bases now in operation are the Fine Particle Emissions Information System (FPEIS), the Gaseous Emissions Data System (GEDS), the Liquid Effluents Data System (LEDS), and the Solid Discharge Data System (SDDS).

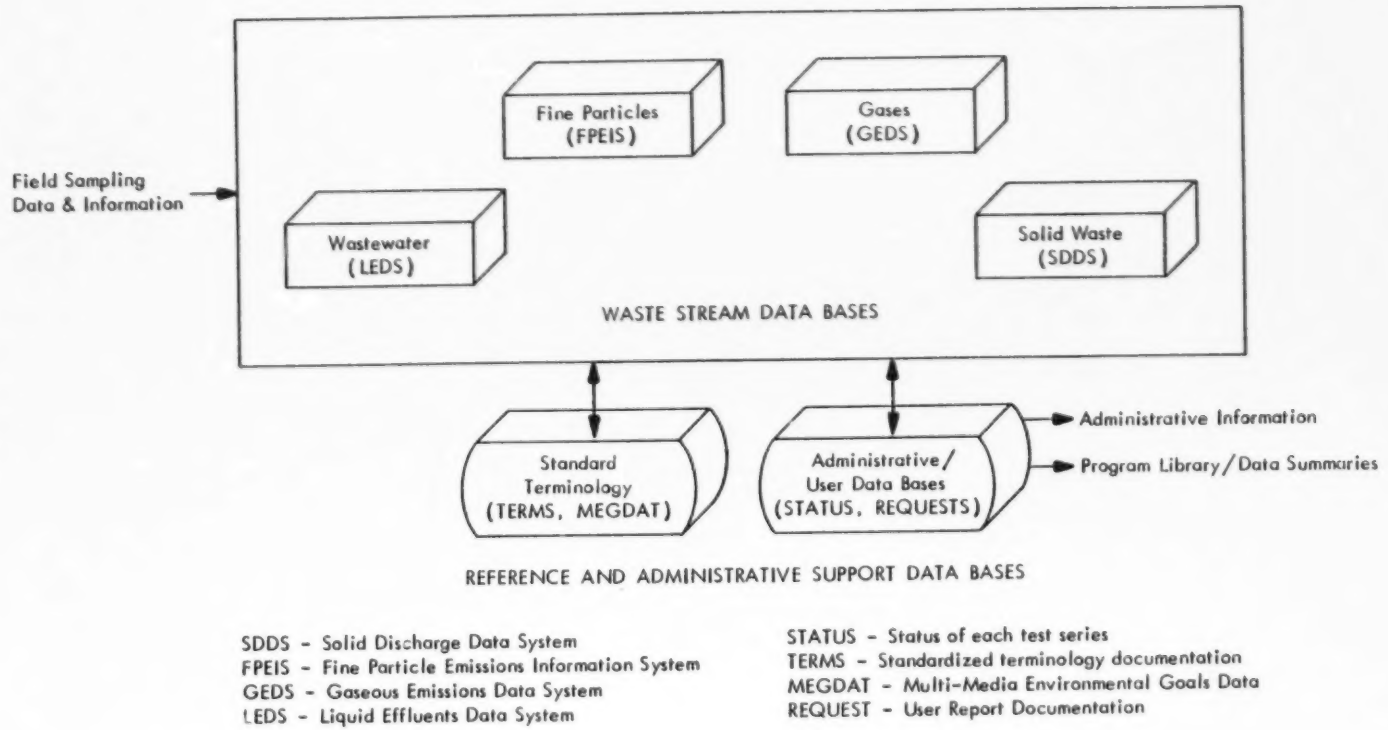


Figure 1. Components of the Environmental Assessment Data Systems.

Each data base contains extensive information on the source of the discharges, on applied control technologies, on fuels or feedstocks, and on the composition of each discharge. The EADS is applicable to most sources, including industrial processes, energy systems, and wastewater treatment plants. The structure of the EADS and the types of data contained in the EADS are discussed in Section 2.

The vast and growing volume of sampling and analysis data produced by EPA, its contractors, and other agencies required a mechanism to consolidate such data. These organizations have produced and still are producing a broad range of data from a variety of industrial and energy sources, and sampling and analysis methods and protocols are constantly evolving. The EADS was created to provide a comprehensive and diverse repository for multimedia environmental sampling and analysis data and to consolidate the data in a central location where they can be readily available to the user community. To meet this provision, the EADS was designed to accommodate a variety of multimedia data from assorted sampling and analysis programs.

One of the requirements of an environmental data base was that a consistent format be used in order to facilitate accurate, reliable data assessments. More specifically, it was essential that data be reported in similar units and be compiled with consistency in engineering conditions, technical bases, etc. To meet this need, the EADS was developed to provide a standardized and uniform protocol for reporting sampling and analysis data.

A critical need existed for current information and standardized data analysis procedures. Thus, the EADS was created to supply current sampling and analysis data for evaluation and to provide standard methods for the retrieval and analysis of the data. The LEDS, for example, has been useful to the Office of Research and Development in the development of the Wastewater Treatability Manual. The EADS is constantly being updated and expanded, and there is a Program Library to aid users in their data evaluation needs through the utilization of standard reports and analysis software.

Finally, and possibly most important, the EADS was created to document the quality of the data reported. EPA is committed to producing environmental data of high quality and to providing a cost-effective means for documenting the results of sampling and analysis programs so that data quality may be determined. The EADS is an integral component of IERL/RTP's approved Quality Assurance (QA) Program Plan and contains specific QA parameters to aid interpretation of the data by the user. The broad applicability and comprehensiveness of the EADS make it particularly suitable for a QA documentation role.

Data from the EADS have been used to model process engineering emissions, to design and evaluate control technology, and for many other applications. Because of the sensitive nature of some stationary source emissions data, EADS provides a special feature which is designed to protect confidential or proprietary source data. If this feature is utilized, EPA will have no knowledge whatsoever of the identity of the source. This feature enables the EADS to obtain, store, and use multimedia emissions data that would otherwise be unavailable. Confidentiality has already been used extensively and has been a great aid in obtaining data which probably would not have been available otherwise.

The EADS is designed as a user-oriented system. A GEDS User Guide[4] is available documenting instructions for data encoding and submittal, along with methods for data retrieval. Use of the GEDS data system and analysis software is described in the GEDS User Guide. Revisions to the documentation are made easily, and supplements are issued as needed.

The EADS Program Library contains an extensive array of user programs, including special reports and computations. Data can be retrieved according to source control technology, sample methods, or other criteria. Data can be requested for the entire EADS or for any of the data bases within the EADS. Specially designed routines are available to interface with statistical packages and to present the data in a variety of reporting formats. For example, the FPEIS data base has a program called PArticle Data REduction (PADRE), which calculates particle distributions from user-supplied

stage weights/concentrations and cut diameters, and stores the results in the FPEIS. These programs are designed to assist the user in obtaining useful and meaningful data in a variety of forms.

The EADS is available at EPA's National Computer Center (NCC) at Research Triangle Park, North Carolina, on the UNIVAC U-1100 computer. The EADS can be accessed directly on the computer by any user who meets the accounting requirements of the NCC or by written or verbal request to the EADS technical support staff.

A key component of the design effort for EADS data bases is flexibility. User needs will change, and the EADS is capable of adapting to these changes in order to remain a useful information resource. The EADS has undergone several improvements since it became operational in 1980 and will undergo additional changes as needed. The EADS is still the only sampling and analysis and engineering data system available today that is completely integrated across media boundaries.

SECTION 2

DESCRIPTION OF THE GEDS DATA BASE

The GEDS data base contains industrial or energy process source emissions test data and related source and control system design and operating data. It describes the gaseous emissions at the point where the gas sample is collected from the discharge stream. This is accomplished through a flexible data base structure and in the definitions of the principal data types that are reported. These data types are defined as data elements, each data element describing a particular piece of information, such as a source characteristic, discharge stream characteristic, control device or treatment process, source operation, test information, analyses of the fuels and feedstocks, sampling activity information, chemical analyses, radionuclide analysis, or bioassay result. The data elements collectively describe the entire source test activity. The GEDS may contain more than 500 discrete data elements for each site test activity reported. The extent (or completeness) of the data contained in the data base depends on the objectives of the specific site test plan.

DATA BASE DIFFERENCES

Before the GEDS is described in detail, it should be noted that the four waste stream data bases (FPEIS, GEDS, LEDS, and SDDS) have the same structure, but due to differences in media, the data elements are not always identical. Each data base was designed to be compatible with the sampling and analysis methods specific to the medium that it covers, while retaining structural similarities with the other media for efficient cross-linking for multimedia sampling analysis reporting.

Each data base contains a cross-reference to those other data bases containing data from the same source at the same point in time. This cross-reference is in the form of a test series number (TSN). Thus, a GEDS file might contain the FPEIS, LEDS, and SDDS test series numbers as cross-references. In the same manner, test series in the other media might contain a cross-reference to the GEDS data base. A summary of the multimedia data currently found in the GEDS is given in Appendix A.

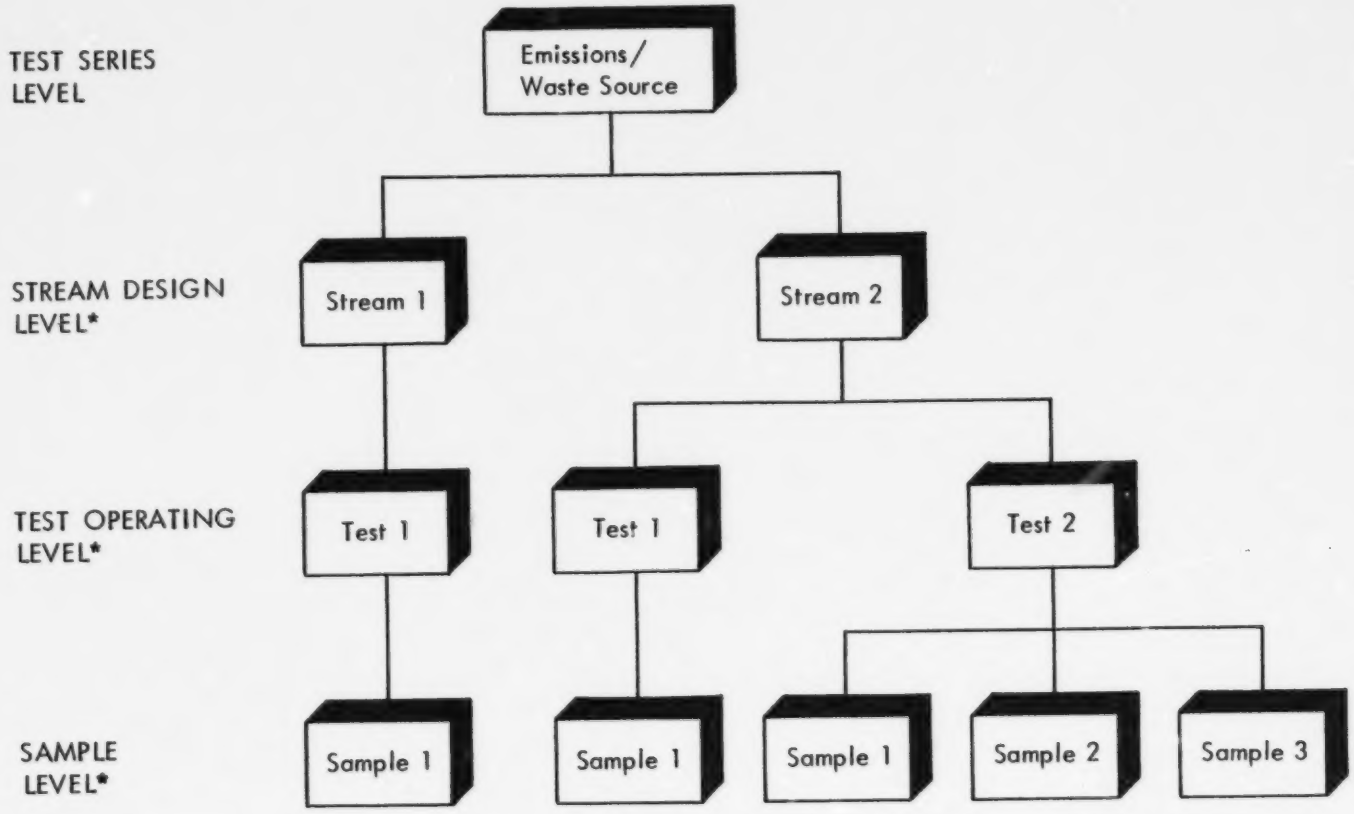
GEDS DESIGN

From an organizational standpoint, the GEDS data elements are grouped into four levels: the test series level, the stream design level, the test operating level, and the sample level. This structure is shown in Figure 2. The data elements are arranged with general information at the uppermost level to specific results found at the lowermost level.

The term test series level is used to designate the uppermost level data base structure. This is where source description data are contained. A test series describes the sampling activities performed at a single site over a specific period of time. Each test series is assigned a unique test series number which can always be used to identify those data.

Below the test series level is the stream design level. Here, each waste stream that has been sampled is fully described, including control device design parameters. As shown in Figure 2, a test series may have multiple streams, although for most GEDS sources only a single discharge stream is likely.

Below the stream design level is the test operating level. As the name implies, operating data for each test are defined here. Source process conditions, as well as operating mode and control device operating data, are reported. Fuels and feedstocks to the process are also completely characterized. A test is defined broadly as a set of various types of samples taken to characterize a gaseous effluent stream under one set of source and control device operating conditions. Again, from Figure 2, there may be



*Multiple Streams, Tests, and Samples indicated to show flexibility of EADS to handle multiples at these levels.

Figure 2. EADS/GEDS organization.

multiple operating conditions of the source under which samples may be collected from the same stream.

The lowermost and most fundamental level of the data base is the sample level. This level describes the collection and subsequent analysis of each discrete sample collected, including measurement equipment particulars, measured stream conditions at the sampling location, and complete physical, chemical, radionuclide, and bioassay data.

This sample level contains a component feature that permits reporting with respect to a measurement instrument component. The GEDS is designed to accommodate the data in any arrangement by allowing the components of the sampling method to be defined according to the needs of the test or analysis.

DATA BASE STRUCTURE

The major categories of data within each level of the data base are given in Figure 3. The data are grouped into the following general categories: general source description and related information; design conditions and parameters of the effluent stream and of the control device or treatment/storage/recovery process; test operating information including analysis of any fuels and feedstock; and sampling activities information including chemical, physical, radionuclide, and biological analysis results.

Source Descriptions

The EADS Source Classification System[3] provides standard terms to enable the general grouping of sources and to facilitate computer searches. In order to provide cross-reference to other government data systems, the source description includes the Standard Industrial Classification (SIC)[4] code as defined by the U.S. Department of Commerce.

The name of the testing organization and the reference (report, journal article, etc.) from which the data have been extracted are included in this

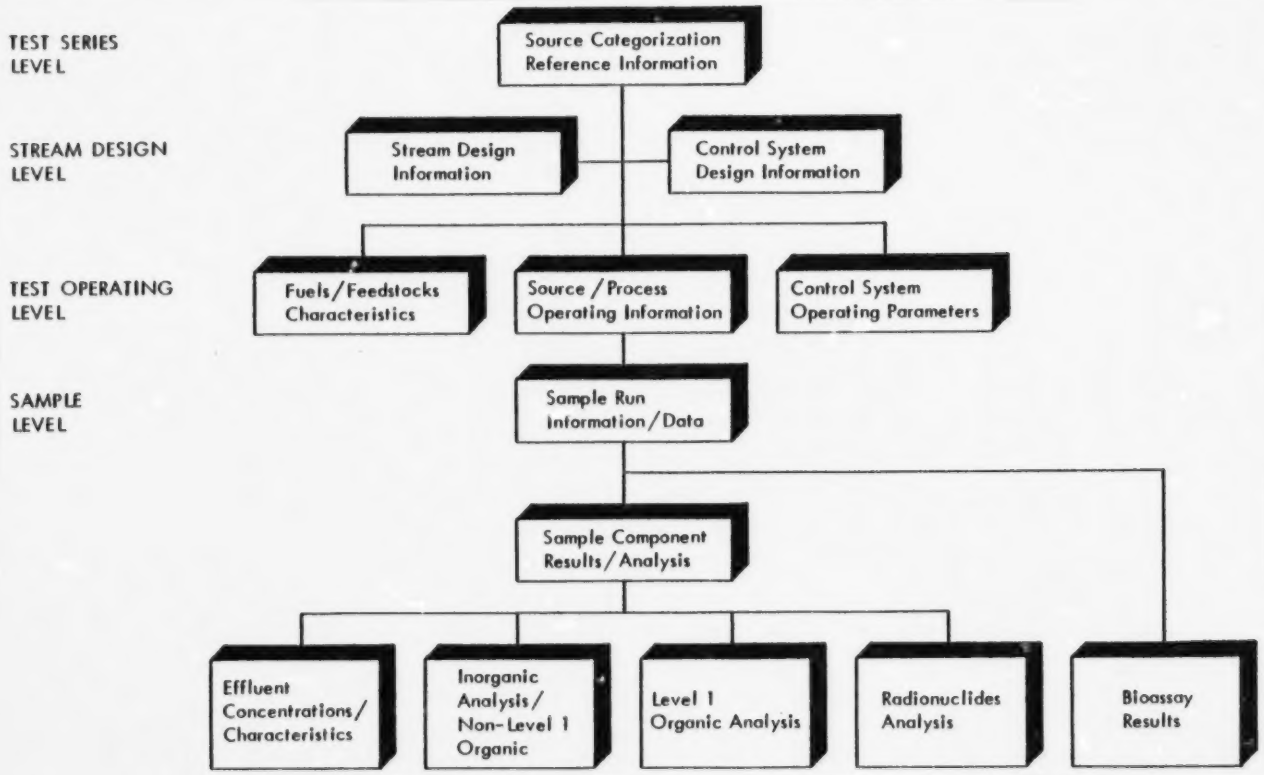


Figure 3. GEDS structure.

category. Additionally, comments or data may be included which may be pertinent to the test series but for which a specific data element is not available. An abstract of the test activity is included to provide a general description of the test series. Indications of the quality of the data are also contained at the test series level. This includes references to availability of test plans and QA plans.

Stream Design Characteristics

The design conditions of the effluent stream at a sampling location are described at this category. For example, data on flow rate, temperature, and pressure may be repeated here. This design information should remain constant from test to test unless the control technology or stream itself is altered in some way.

Control Device Design Characteristics

This category contains design information and descriptions of any control technology for the test series. Information provided includes commercial name, manufacturer, or other items to characterize the control technology. Available design parameters are included to provide additional characterization.

Test Identification

This category provides actual operating conditions of the source process and any control technology. The information includes test data and times and operating conditions of the source, such as plant output or amount of fuel used. Actual operating characteristics of the control technology, such as pressure drops, are provided.

Fuels and Feedstock Characteristics

This category includes data describing all fuels and feedstocks that are inputs to the process being tested. This can help to provide a comprehensive

assessment of the material balances on a source. The GEDS contains data on the consumption rate and type of fuel or feedstock and general characteristics such as physical parameters. In addition to an ultimate and proximate analysis of the fuels consumed in a process, GEDS is designed to accept inorganic and organic chemical analysis data.

Sampling Activity Description

This category contains information that describes the individual sampling activity. Information about the sample method and activity is provided, including measurement instrument type and name, measurement flows, and temperatures. Actual stream conditions, as measured at the sampling location, can be provided. In addition, the sampling location itself can be described so that its location with respect to a single control or treatment process is clear, as well as its location with respect to a total system or group of control processes.

Component Description

Frequently, a measurement instrument or sample will contain two or more components, each of which is analyzed separately. This category is provided to describe each component individually and report results obtained from the analysis on each component. Regardless of the number of components making up a measurement instrument or sample, this category describes the chemical, physical, biological, and radionuclide results available. Also, physical parameters such as opacity, odor, or color can be described. A description follows of the types of analyses available in this category.

Inorganic/Non-Level 1 or 2 Organic Analysis

The GEDS is designed to accept all inorganic results and organic results that do not conform to Level 1 or 2 protocols[5]; that is, species-specific organic results. Results of the inorganic or non-Level 1 or 2 analysis are typically presented as the identification of the species analyzed and the actual source concentration as contributed by each component.

The GEDS recognizes the existence of a variety of coding systems for identifying chemical species and compounds. Users are able to use two chemical identification schemes, the Chemical Abstract Services (CAS) registration numbers, and the Multimedia Environmental Goals (MEG)[6] numbers.

Level 1 or 2 Organic Analysis

Level 1 or 2 organic analyses require special reporting formats due to the mix of qualitative and semiquantitative results from analyses such as liquid chromatography fractionation and low resolution mass spectroscopy (LRMS). The purpose of this type of analysis is to identify the major classes of organic compounds in a process effluent stream and to estimate their concentrations. Special provisions have been included to accommodate the organic species reporting protocol of a Level 1 or 2 environmental assessment sampling and analysis program. Gas chromatography data are also available under the Level 1 protocol.

Radionuclide Analysis

When available, the GEDS can accept and report radionuclide data results. Actual source concentrations of radionuclides are presented as picocuries per cubic meter (pCi/m^3).

Bioassay Analysis

Biological indicators are sometimes coupled with chemical tests to assess more accurately the hazard potential of process effluent streams. The Level 1 screening phase uses a series of short-term bioassays to detect acute biological effects. Bioassays may be either health-related or ecology-related. The GEDS report results in terms of concentrations, mutagenicity, and toxicity levels.

SECTION 3

DATA SUMMARY

The GEDS data base contains approximately 450 samples from about 100 source tests. Gaseous sampling frequently involves complex procedures requiring duplicate and triplicate samples. The rate of growth of the GEDS is expected to level off somewhat as concern with air pollution is supplanted by greater concern with toxic and hazardous pollutants, particularly at the Federal level. Toxic and hazardous pollutants are primarily a liquid and solid media problem. A complete list of test series in the GEDS and their source category identifiers is given in Appendix B.

GEDS SOURCES SUMMARY

Many data contained in the GEDS are results from environmental assessment studies conducted for the EPA during the last 5 years. These studies are often multimedia, and any corresponding data in other media may be located in the corresponding data bases (see Appendix A). Over 70 percent of all test series in the GEDS have been conducted on combustion energy sources; the remainder are primarily in the metals and minerals source category. Of the combustion energy source tests, there is a relatively even distribution of control device types. Control device types include combustion modifications (including fuel additives), electrostatic precipitators, filtering devices, afterburners, liquid scrubbers, and mechanical collectors. Table 1 summarizes the source categories, and Table 2 summarizes the control device data available in the GEDS.

TABLE 1. SUMMARY OF SOURCE CATEGORIES IN GEDS

PRINT-001

ENVIRONMENTAL ASSESSMENT DATA SYSTEMS
SOURCE CATEGORY SUMMARY

PAGE: 001
DATE: 05/02/83

DATA BASE: GEDS

WHERE CLAUSE FOLLOWS:
WH C355 LT 01/01/83

SOURCE CATEGORY	SOURCE TYPE	PRODUCT OR DEVICE	PROCESS TYPE	SIC	NUMBER OF TEST SERIES	NUMBER OF SAMPLES
AGRICHEMICALS	FERTILIZERS	MIXED FERTILIZER	BLENDING	2875	1	2
CHEMICAL MANUFAC	INDUSTRIAL INORGANIC	BORIC ACID	BOILER	2819	1	5
CHEMICAL MANUFAC	INDUSTRIAL INORGANIC	BORIC ACID	BORAX + SULFURIC	2819	1	2
COMBUST-ENERGY	GOVERNMENT	INTERNAL COMBUST	RECIPROCATING ENGINE	4900	1	4
COMBUST-ENERGY	INDUSTRIAL	BOILER	FIRETUBE	4960	5	29
COMBUST-ENERGY	INDUSTRIAL	BOILER	SINGLE WALL	4960	1	12
COMBUST-ENERGY	INDUSTRIAL	BOILER	STOKER	4960	2	4
COMBUST-ENERGY	INDUSTRIAL	BOILER	WATERTUBE	4960	1	4
COMBUST-ENERGY	INDUSTRIAL	INTERNAL COMBUST	RECIPROCATING ENGINE	4960	2	14
COMBUST-ENERGY	RESIDENTIAL	FURNACE	SINGLE BURNER	4900	3	15
COMBUST-ENERGY	UTILITY	BOILER	CYCLONE	4911	6	31
COMBUST-ENERGY	UTILITY	BOILER	HORIZ OPPOSED WALL	4911	7	48
COMBUST-ENERGY	UTILITY	BOILER	NOT SPECIFIED	4911	2	3
COMBUST-ENERGY	UTILITY	BOILER	SINGLE WALL	4911	10	26
COMBUST-ENERGY	UTILITY	BOILER	STOKER	4911	5	10
COMBUST-ENERGY	UTILITY	BOILER	TANGENTIAL	4911	7	59
COMBUST-ENERGY	UTILITY	INTERNAL COMBUST	RECIPROCATING ENGINE	4911	6	21
COMBUST-ENERGY	UTILITY	INTERNAL COMBUST	SIMPLE CYCLE TURBINE	4911	7	14
CONSUMER PRODUCTS	GLASS & GLASS PROD	GLASS BOTTLES	MANUFACTURE	3221	3	13
FABRICATED MTL PROD	METAL PRODUCTS	AUTOMOBILES	SURFACE COATING	3449	2	6
FOOD INDUSTRY	GRAIN MILL PRODUCTS	CAROB KIBBLE	ROASTING	2041	1	3
FOOD INDUSTRY	GRAIN MILL PRODUCTS	RICE	PROCESSING	2044	1	3
LUMBER & WOOD PROD	MILLWORK	HOUSING PRODUCTS	FINISHING	2431	1	3
LUMBER & WOOD PROD	WOOD	LUMBER	SAWMILL OPERATIONS	2421	2	6
METALS	PRIMARY FERROUS	STEEL	ABRASIVE BLASTING	3312	1	2
METALS	PRIMARY FERROUS	STEEL	HEAT TREATING	3312	1	3
METALS	PRIMARY FERROUS	STEEL	SINTERING	3312	1	6
METALS	SEC NONFERROUS	ALUMINUM	REVERB FURNACE	3341	1	3
METALS	SECONDARY FERROUS	STEEL	OPEN HEARTH	3320	1	6
MINERALS	BUILDING MATERIALS	BRICK	MANUFACTURE	3251	1	2
MINERALS	BUILDING MATERIALS	CEMENT	PRODUCTION	3241	2	6
MINERALS	BUILDING MATERIALS	FIBERGLASS WOOL	MANUFACTURE	3296	1	4
MINERALS	BUILDING MATERIALS	GYPSUM PRODUCTS	CALCINING	3275	1	2
PETROLEUM REFINING	INTERMEDIATE DIST	HEAVY FUEL OILS	PROCESS HEATER	2911	1	2

(continued)

TABLE 1. (continued)

PRINT-001

ENVIRONMENTAL ASSESSMENT DATA SYSTEMS
SOURCE CATEGORY SUMMARY

PAGE: 002
DATE: 05/02/83

DATA BASE: GEDS

WHERE CLAUSE FOLLOWS:
WH C355 LT 01/01/83

SOURCE CATEGORY	SOURCE TYPE	PRODUCT OR DEVICE	PROCESS TYPE	SIC	NUMBER OF TEST SERIES	NUMBER OF SAMPLES
PETROLEUM REFINING	LIGHT DISTILLATES	GASOLINE	CRACKING	2911	1	3
PETROLEUM REFINING	PAVING & ROOFING MTL	ASPHALT	BATCHING	2951	1	6
PETROLEUM REFINING	PAVING & ROOFING MTL	ASPHALT	ROOFING	2952	1	4

TABLE 2. SUMMARY OF CONTROL DEVICES IN GEDS

Generic name	Design type	Specific process type	Number of test series
Comb modifications	Combustion chamber modifications	Air/fuel changes	1
Comb modifications	Combustion chamber modifications	Exhaust gas recirc	1
Comb modifications	Combustion chamber modifications	Retarded ignition	1
Comb modifications	Fuel additives/furnace reactants	Not specified	3
Comb modifications	Fuel additives/furnace reactants	Sox reducers	1
Comb modifications	Furnace/burner modifications	Not specified	1
Comb modifications	Furnace/burner modifications	Boos	1
Comb modifications	Furnace/burner modifications	Flue gas recirc	2
Comb modifications	Furnace/burner modifications	H20/steam injection	1
Comb modifications	Furnace/burner modifications	Low nox burners	1
Comb modifications	Furnace/burner modifications	Low xs air firing	2
Comb modifications	Furnace/burner modifications	Off-stoich stgd comb	1
Comb modifications	Furnace/burner modifications	Overfire air	1
ESP	Not specified	Not specified	14
ESP	Single stage	Cold side	3
ESP	Single stage	Plate	1
ESP	Two-stage	High intensity ion	1
Filters	Fabric	Not specified	7
Filters	Fabric	Aynaclone	1
Filters	Fabric	Pulse jet type	1
Filters	Fabric	Reverse air	3
Filters	Viscous filters	Cheaf	1
Incineration	Direct	Afterburner	1

(continued)

TABLE 2. (continued)

Generic name	Design type	Specific process type	Number of test series
Liquid scrubbers	Not specified	Not specified	1
Liquid scrubbers	Absorption processes	Double alkali	1
Liquid scrubbers	Absorption processes	Wellman-lord	1
Liquid scrubbers	Plate columns	Sieve tray	1
Liquid scrubbers	Spray type scrubbers	Gravity spray tower	1
Liquid scrubbers	Spray type scrubbers	Water curtain	1
Liquid scrubbers	Spray type scrubbers	Water jet	1
Liquid scrubbers	Venturi scrubbers	Not specified	1
Mechanical collector	Not specified	Not specified	2
Mechanical collector	Cyclones	Not specified	4
Mechanical collector	Cyclones	Multiclone	7
Mechanical collector	Mist eliminators	Not specified	1
None	Not specified	Not specified	32

CHEMICAL DATA SUMMARY

The majority of discharge data in the GEDS are emissions of gaseous and volatile compounds from combustion, metal, and mineral source categories. Sampling methods are typically EPA-approved methods, including continuous monitors and the Source Assessment Sampling System (SASS). The SASS yields samples of volatile organic and inorganic species in the flue gas in one sampling train.

The EADS Program Library includes user programs that retrieve data in summary form. Table 3 summarizes air priority pollutants found in the GEDS. Table 4 lists the pollutants designated as hazardous under the Resource Conservation and Recovery Act (RCRA) which may be found in the GEDS. These listings serve as examples of summaries available; other selection possibilities may include NAAQS criteria pollutants, Section III-D air pollutants, Section 311 hazardous pollutants, metals, and pesticides. These programs are also capable of providing the minimum, maximum, mean, median, and standard deviation of chemical pollutant concentrations for selected source category/control device combinations.

TABLE 3. AIR PRIORITY POLLUTANTS IN GEDS

Pollutant preferred name	Number of test series	Number of samples
Carbon tetrachloride	1	4
Manganese	7	8
Methylene chloride (dichloromethane)	1	4
Nickel	7	8
Toluene	1	4
Trichloroethylene	1	1

TABLE 4. RCRA HAZARDOUS WASTE POLLUTANTS IN GEDS

Pollutant preferred name	Number of test series	Number of samples
Beryllium	6	6
Carbon tetrachloride	1	4
Diethyl phthalate	1	1
Fluorine	5	6
Hydrogen fluoride	2	4
Mercury	5	5
Methyl methacrylate	1	4
Methylene chloride (dichloromethane)	1	4
Naphthalene	4	4
Nitric oxide	1	2
Nitrogen dioxide	2	8
Tetrahydrofuran	1	4
Toluene	1	4
Trichloroethylene	1	1
Vinyl chloride (chloroethylene)	1	4
Xylenes	1	1

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APPENDIX A

ENVIRONMENTAL ASSESSMENT DATA SYSTEMS
MULTIMEDIA REPORT FOR GEDS

The Multimedia Report identifies GEDS Test Series for which sampling and analysis data in other media were taken concurrently and also reported in companion EADS data bases. This summary identifies the true "multimedia" GEDS Test Series.

GEDS Test Series Number	Corresponding Multimedia Test Series Numbers		
	FPEIS	LEDS	SDDS
00001	00200		00010
00002	00201		00027
00003	00202		
00004	00203		
00005	00204		
00006	00172		00011
00007	00173		00012
00009	00266	00390	00013
00010	00267	00391	00014
00011	00174	00392	00015
00012	00175	00393	
00013	00318		
00014	00319		
00015	00320		
00016	00321		
00017	00171	00394	00016
00018	00179	00395	
00019	00180	00396	
00020	00181	00397	
00021	00322		
00022	00323		
00023	00184		00017
00024	00185		00018
00025	00190		
00026	00166		00019
00027	00167		00020
00028	00311	00398	00021
00029	00312	00399	00022
00030	00313		
00031	00168	00401	00023
00032	00314	00402	00024
00033	00191	00403	
00034	00192	00404	
00035	00193		
00036	00194		
00037	00197		
00038	00198	00405	
00039	00324		
00040	00325		
00041	00265		
00042	00196		
00043	00195		
00044	00315	00406	
00045		00407	
00046		00408	
00047	00326		

GEDS Test Series Number	Corresponding Multimedia Test Series Numbers		
	FPEIS	LEDS	SDDS
00048	000327		
00049	00328		
00055	00292	00414	00009
00057	00205		
00058	00206		
00059	00207		
00060	00208		
00061	00209		
00062	00210		
00063	00211		
00064	00212		
00065	00213		
00066	00214		
00067	00215		
00068	00216		
00069	00217		
00070	00218		
00071	00219		
00072	00220		
00073	00221		
00074	00222		
00075	00223		
00076	00224		
00077	00225		
00078	00226		
00079	00227		
00080	00228		
00081	00229		
00082	00230		
00083	00231		
00084	00232		
00085	00233		
00086	00234		
00087	00235		
00088	00236		
00089	00237		
00090	00238		
00091	00239		
00092	00240		
00093	00241		

APPENDIX B

GASEOUS EMISSIONS DATA SYSTEM
TEST SERIES SOURCE
SUMMARY

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ENVIRONMENTAL ASSESSMENT DATA SYSTEMS
TEST SERIES SOURCE SUMMARY

PAGE: 001
DATE: 05/02/83

DATA BASE: GEDS

WHERE CLAUSE FOLLOWS:
WH C355 LT 01/01/83

TEST SERIES NUMBER	SOURCE CATEGORY	SOURCE TYPE	PRODUCT/ DEVICE	PROCESS TYPE	FEED MATERIAL CATEGORY	NUMBER OF SAMPLES
00001	COMBUST-ENERGY	INDUSTRIAL	BOILER	STOKER	COAL	2
00002	COMBUST-ENERGY	INDUSTRIAL	BOILER	STOKER	COAL	2
00003	COMBUST-ENERGY	UTILITY	BOILER	HORIZ OPPOSED WALL	OIL	4
00004	COMBUST-ENERGY	UTILITY	INTERNAL COMBUST	SIMPLE CYCLE TURBINE	OIL	2
00005	COMBUST-ENERGY	RESIDENTIAL	FURNACE	SINGLE BURNER	OIL	4
00006	COMBUST-ENERGY	UTILITY	BOILER	SINGLE WALL	COAL	3
00007	COMBUST-ENERGY	UTILITY	BOILER	SINGLE WALL	COAL	3
00008	COMBUST-ENERGY	UTILITY	BOILER	NOT SPECIFIED	COAL	2
00010	COMBUST-ENERGY	UTILITY	BOILER	TANGENTIAL	COAL	47
00011	COMBUST-ENERGY	UTILITY	BOILER	SINGLE WALL	COAL	2
00012	COMBUST-ENERGY	UTILITY	BOILER	SINGLE WALL	COAL	2
00013	COMBUST-ENERGY	UTILITY	INTERNAL COMBUST	SIMPLE CYCLE TURBINE	GAS	2
00014	COMBUST-ENERGY	UTILITY	INTERNAL COMBUST	SIMPLE CYCLE TURBINE	OIL	2
00015	COMBUST-ENERGY	UTILITY	INTERNAL COMBUST	SIMPLE CYCLE TURBINE	OIL	2
00016	COMBUST-ENERGY	UTILITY	INTERNAL COMBUST	SIMPLE CYCLE TURBINE	OIL	2
00017	COMBUST-ENERGY	UTILITY	BOILER	CYCLONE	COAL	22
00018	COMBUST-ENERGY	UTILITY	BOILER	CYCLONE	COAL	2
00019	COMBUST-ENERGY	UTILITY	BOILER	CYCLONE	COAL	1
00020	COMBUST-ENERGY	UTILITY	BOILER	CYCLONE	COAL	2
00021	COMBUST-ENERGY	UTILITY	INTERNAL COMBUST	SIMPLE CYCLE TURBINE	OIL	2
00022	COMBUST-ENERGY	UTILITY	INTERNAL COMBUST	SIMPLE CYCLE TURBINE	OIL	2
00023	COMBUST-ENERGY	UTILITY	BOILER	STOKER	COAL	2
00024	COMBUST-ENERGY	UTILITY	BOILER	STOKER	COAL	2
00025	COMBUST-ENERGY	UTILITY	BOILER	STOKER	COAL	2
00027	COMBUST-ENERGY	UTILITY	BOILER	SINGLE WALL	COAL	2
00028	COMBUST-ENERGY	UTILITY	BOILER	SINGLE WALL	COAL	2
00029	COMBUST-ENERGY	UTILITY	BOILER	CYCLONE	COAL	2
00030	COMBUST-ENERGY	UTILITY	BOILER	CYCLONE	COAL	2
00031	COMBUST-ENERGY	UTILITY	BOILER	STOKER	COAL	2
00032	COMBUST-ENERGY	UTILITY	BOILER	STOKER	COAL	2
00033	COMBUST-ENERGY	UTILITY	BOILER	TANGENTIAL	OIL	2
00034	COMBUST-ENERGY	UTILITY	BOILER	TANGENTIAL	OIL	2
00035	COMBUST-ENERGY	UTILITY	BOILER	TANGENTIAL	OIL	2
00036	COMBUST-ENERGY	UTILITY	BOILER	TANGENTIAL	OIL	2
00037	COMBUST-ENERGY	UTILITY	BOILER	SINGLE WALL	OIL	2
00038	COMBUST-ENERGY	UTILITY	BOILER	NOT SPECIFIED	OIL	1
00039	COMBUST-ENERGY	UTILITY	INTERNAL COMBUST	RECIPROCATING ENGINE	OIL	5
00040	COMBUST-ENERGY	UTILITY	INTERNAL COMBUST	RECIPROCATING ENGINE	OIL	2
00041	COMBUST-ENERGY	UTILITY	BOILER	HORIZ OPPOSED WALL	OIL	10
00042	COMBUST-ENERGY	UTILITY	BOILER	HORIZ OPPOSED WALL	OIL	2
00043	COMBUST-ENERGY	UTILITY	BOILER	SINGLE WALL	OIL	2
00044	COMBUST-ENERGY	UTILITY	BOILER	TANGENTIAL	GAS	2

DATA BASE: GEDS

WHERE CLAUSE FOLLOWS:
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TEST SERIES NUMBER	SOURCE CATEGORY	SOURCE TYPE	PRODUCT/ DEVICE	PROCESS TYPE	FEED MATERIAL CATEGORY	NUMBER OF SAMPLES
00046	COMBUST-ENERGY	UTILITY	BOILER	TANGENTIAL	GAS	2
00047	COMBUST-ENERGY	UTILITY	INTERNAL COMBUST	RECIPROCATING ENGINE	OIL	2
00048	COMBUST-ENERGY	UTILITY	INTERNAL COMBUST	RECIPROCATING ENGINE	OIL	5
00049	COMBUST-ENERGY	UTILITY	INTERNAL COMBUST	RECIPROCATING ENGINE	OIL	5
00050	COMBUST-ENERGY	INDUSTRIAL	BOILER	FIRETUBE	MIXED FUEL	8
00051	COMBUST-ENERGY	INDUSTRIAL	INTERNAL COMBUST	RECIPROCATING ENGINE	OIL	8
00052	COMBUST-ENERGY	INDUSTRIAL	INTERNAL COMBUST	RECIPROCATING ENGINE	GAS	6
00053	COMBUST-ENERGY	RESIDENTIAL	FURNACE	SINGLE BURNER	OIL	6
00054	COMBUST-ENERGY	RESIDENTIAL	FURNACE	SINGLE BURNER	OIL	5
00055	COMBUST-ENERGY	UTILITY	BOILER	HORIZ OPPOSED WALL	COAL	20
00056	COMBUST-ENERGY	INDUSTRIAL	BOILER	SINGLE WALL	MIXED FUEL	12
00057	COMBUST-ENERGY	INDUSTRIAL	BOILER	FIRETUBE	OIL	4
00058	COMBUST-ENERGY	INDUSTRIAL	BOILER	FIRETUBE	OIL	4
00059	COMBUST-ENERGY	INDUSTRIAL	BOILER	FIRETUBE	OIL	5
00060	CHEMICAL MANUFAC	INDUSTRIAL INORGANIC	BORIC ACID	BOILER	OIL	5
00061	COMBUST-ENERGY	GOVERNMENT	INTERNAL COMBUST	RECIPROCATING ENGINE	GAS	4
00062	COMBUST-ENERGY	UTILITY	INTERNAL COMBUST	RECIPROCATING ENGINE	OIL	2
00063	LUMBER & WOOD PROD	WOOD	LUMBER	SAWMILL OPERATIONS	WOOD	4
00064	COMBUST-ENERGY	UTILITY	BOILER	HORIZ OPPOSED WALL	OIL	4
00065	COMBUST-ENERGY	UTILITY	BOILER	HORIZ OPPOSED WALL	OIL	4
00066	COMBUST-ENERGY	UTILITY	BOILER	HORIZ OPPOSED WALL	OIL	4
00067	MINERALS	BUILDING MATERIALS	GYPSUM PRODUCTS	CALCINING	INORG CHEM	2
00068	MINERALS	BUILDING MATERIALS	BRICK	MANUFACTURE	INORG CHEM	2
00069	MINERALS	BUILDING MATERIALS	CEMENT	PRODUCTION	INORG CHEM	3
00070	MINERALS	BUILDING MATERIALS	CEMENT	PRODUCTION	INORG CHEM	3
00071	CONSUMER PRODUCTS	GLASS & GLASS PROD	GLASS BOTTLES	MANUFACTURE	INORG CHEM	6
00072	METALS	PRIMARY FERROUS	STEEL	HEAT TREATING	INORG CHEM	3
00073	COMBUST-ENERGY	UTILITY	BOILER	SINGLE WALL	MIXED FUEL	4
00074	COMBUST-ENERGY	UTILITY	BOILER	SINGLE WALL	MIXED FUEL	4
00075	CONSUMER PRODUCTS	GLASS & GLASS PROD	GLASS BOTTLES	MANUFACTURE	INORG CHEM	3
00076	CONSUMER PRODUCTS	GLASS & GLASS PROD	GLASS BOTTLES	MANUFACTURE	INORG CHEM	4
00077	MINERALS	BUILDING MATERIALS	FIBERGLASS WOOL	MANUFACTURE	INORG CHEM	4
00078	PETROLEUM REFINING	PAVING & ROOFING MTL	ASPHALT	ROOFING	OIL	4
00079	PETROLEUM REFINING	PAVING & ROOFING MTL	ASPHALT	BATCHING	MISC CHEM	6
00080	FOOD INDUSTRY	GRAIN MILL PRODUCTS	RICE	PROCESSING	AGRI FEED	3
00081	FOOD INDUSTRY	GRAIN MILL PRODUCTS	CAROB KIBBLE	ROASTING	AGRI FEED	3
00082	METALS	PRIMARY FERROUS	STEEL	ABRASIVE BLASTING	INORG CHEM	2
00083	METALS	SEC NONFERROUS	ALUMINUM	REVERB FURNACE	ORE/SCRAP	3
00084	METALS	PRIMARY FERROUS	STEEL	SINTERING	METAL ORE	6
00085	METALS	SECONDARY FERROUS	STEEL	OPEN HEARTH	MTL SCRAP	6
00086	FABRICATED MTL PROD	METAL PRODUCTS	AUTOMOBILES	SURFACE COATING	INORG CHEM	3
00087	FABRICATED MTL PROD	METAL PRODUCTS	AUTOMOBILES	SURFACE COATING	INORG CHEM	3

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ENVIRONMENTAL ASSESSMENT DATA SYSTEMS
TEST SERIES SOURCE SUMMARY

PAGE: 003
DATE: 05/02/83

DATA BASE: GEDS

WHERE CLAUSE FOLLOWS:
WH C355 LT 01/01/83

TEST SERIES NUMBER	SOURCE CATEGORY	SOURCE TYPE	PRODUCT/ DEVICE	PROCESS TYPE	FEED MATERIAL CATEGORY	NUMBER OF SAMPLES
00088	CHEMICAL MANUFAC	INDUSTRIAL INORGANIC	BORIC ACID	BORAX + SULFURIC	INORG CHEM	2
00089	AGRICHEMICALS	FERTILIZERS	MIXED FERTILIZER	BLENDING	INORG CHEM	2
00090	LUMBER & WOOD PROD	MILLWORK	HOUSING PRODUCTS	FINISHING	WOOD	3
00091	LUMBER & WOOD PROD	WOOD	LUMBER	SAWMILL OPERATIONS	WOOD	2
00092	PETROLEUM REFINING	INTERMEDIATE DIST	HEAVY FUEL OILS	PROCESS HEATER	GAS	2
00093	PETROLEUM REFINING	LIGHT DISTILLATES	GASOLINE	CRACKING	OIL	3
00189	COMBUST-ENERGY	INDUSTRIAL	BOILER	WATERTUBE	MIXED FUEL	4
00190	COMBUST-ENERGY	INDUSTRIAL	BOILER	FIRETUBE	MIXED FUEL	8